

REMARKS

In response to the June 14, 2006 Final Office action, Applicants respond to the Examiner's detailed action with the following remarks numbered according to the Examiner's communication. Claims 13, 14, and 27-29 are pending and rejected in the application. Claims 13 and 27 are amended hereby.

Claim Rejections – 35 USC §112

1-2. In response to the Examiner's rejection of Claims 13, 14, and 27-29 under 35 U.S.C. §112, first paragraph, Applicants have amended Claims 13 and 27 to particularly claim the piezoelectric transducers. Referring to the fourth and sixth sentences of paragraph [0023] (as numbered in the U.S. published patent application, document number US 2002/0038662 A1), the specification makes a distinction between the transducer 30, which may be referred to as the transducer assembly, and the piezoelectric transducers 42, 44, which are the actual piezoelectric devices that generate the megasonic waves. It was intended that Claims 13 and 27 refer to one of the piezoelectric transducers 42, 44 in the March 30, 2006 amendment. This was indicated by the fact that the claims require the generation of two or more waves and each wave is generated by a transducer. Thus, there would be two or more transducers. The presently amended Claims 13 and 27, however, particularly refer to a piezoelectric transducer.

Referring to paragraph [0025] and Figs. 1 and 2 of the present patent application, it is clear that each of the piezoelectric transducers 42, 44 have a long side and a short side and that the faces of the wafers are perpendicular to the short side of the piezoelectric transducers. Also, the movement of the wafers is in the direction shown by arrow 6, which is parallel to the short side of the piezoelectric transducers 42, 44.

Thus, the amended Claims 13 and 27, and the claims that depend therefrom, are supported by the specification and figures. Applicants respectfully submit that Claims 13, 14, and 27-29 are now in condition for allowance.

3-4. In response to the Examiner's rejection of Claims 13, 14, and 27-29 under 35 U.S.C. §112, second paragraph, Applicants have amended Claims 13 and 27 to define the long side and the short side as those in a plane that is substantially parallel to a proximate

surface of the cleaning fluid. By way of example, in the embodiment shown in Figs. 1 and 2, the proximate surface of the cleaning fluid is the bottom surface thereof, which is in contact with the bottom of the container 5. Thus, it is now clear which two sides of the three-dimensional body of the piezoelectric transducer are referred to in Claims 13 and 27 and the claims that depend therefrom. Applicant respectfully submits that Claims 13, 14, and 27-29 are now in condition for allowance.

Response to Amendment

5. The Examiner has objected to the amendment filed March 30, 2006 under 35 U.S.C. 132(a) for introducing new matter to the disclosure. In response, Applicants have amended Claims 13 and 27 such that the claims are clearly supported by the original disclosure as described above. Applicant therefore respectfully submits that no new matter has been added to the disclosure.

Claim Rejections – 35 USC §102

6-7. Responsive to the Examiner's rejection of Claims 13, 14, and 27 – 29 under 35 U.S.C. 102(b) as being anticipated by U.S. 5,533,540 (Stanasolovich, et al.), Applicants have amended Claims 13 and 27 to define the long side and the short side as those in a plane that is substantially parallel to a proximate surface of the cleaning fluid and to particularly refer to a piezoelectric transducer, such as the piezoelectric transducers 42, 44, as described above. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Stanasolovich teaches a megasonic cleaner with one or more transducers positioned at the bottom of a recirculation tank. An oscillating arm oscillates the wafer cassette within the recirculation tank. Stanasolovich does not teach the shape of the transducers or the direction of motion of the wafer cassette relative to an aspect of the transducer shape. In contrast, Claims 13 and 27 require that each transducer have "a long side and a short side," and that the wafers are moved "parallel to the short side of the piezoelectric transducer" (i.e. in the direction denoted by arrow 6 in Figs. 1 and 2).

Further, the amended Claims 13 and 27 define the long side and the short side as being in a plane that is substantially parallel to a proximate surface of the cleaning fluid. Since Stanasolovich does not teach the shape of the transducers in the plane substantially parallel to the proximate surface of the cleaning fluid, Applicants respectfully submit that Claims 13 and 27, as well as the claims that depend therefrom, are in condition for allowance.

8. Responsive to the Examiner's rejection of Claims 13, 14, and 27 – 29 under 35 U.S.C. 102(b) as being anticipated by any one of U.S. 3,893,869 and U.S. 4,118,649 (Mayer and Schwartzman), Applicants have amended Claims 13 and 27 as indicated above. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Mayer and Schwartzman teach a megasonic cleaning system with transducers mounted on a vertical septum or end. The wafers are moved in directions that are parallel to the septum or end. Neither of the Mayer and Schwartzman patents teach that the motion of the wafers is relative to an aspect of the shape of the transducers. Further, neither of the Mayer and Schwartzman patents teach a transducer having a long side and a short side in a plane substantially parallel to the proximate surface of the cleaning fluid. In contrast, the amended Claims 13 and 27 require that each transducer have "a long side and a short side," and that the wafers are moved "parallel to the short side of the piezoelectric transducer," wherein the long side and the short side are in a plane substantially parallel to a proximate surface of the cleaning fluid. Since the Mayer and Schwartzman patents do not teach these limitations, Applicants respectfully submit that Claims 13 and 27, as well as the claims that depend therefrom, are in condition for allowance.

Claim Rejections – 35 USC §103

9-10. Applicants submit that the subject matter of the claims was commonly owned at the time of invention.

11-12. Responsive to the Examiner's rejection of Claims 13, 14, and 27 – 29 under 35 U.S.C. 103(a) as being unpatentable over U.S. 6,085,764 (Kobayashi, et al.) in view of Handbook of Semiconductor Wafer Cleaning Technology (HSWCT), Applicants have amended Claims 13 and 27 as described above. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Kobayashi teaches an ultrasonic cleaning apparatus with an ultrasonic vibrator attached to the bottom of a tank. The wafers are vibrated minutely at ultrasonic frequencies in a horizontal and a vertical direction. Kobayashi does not teach the generation of megasonic waves – the frequency range of 26 to 40kHz taught by Kobayashi on lines 61 to 62 of column 2 are well within the ultrasonic range. Further, Kobayashi does not teach the shape of the ultrasonic transducers in a plane that is substantially parallel to a proximate surface of the cleaning fluid or the motion relative to an aspect of the transducers' shape. The HSWCT adding the use of megasonic transducer arrays does not overcome all of these deficiencies. In contrast, the amended Claims 13 and 27 require that each piezoelectric transducer have "a long side and a short side," and that the wafers are moved "parallel to the short side of the transducer," wherein "the long side and the short side being in a plane that is substantially parallel to a proximate surface of the cleaning fluid."

Since Kobayashi and the HSWCT do not teach all the limitations of Claims 13 and 27, Applicants respectfully submit that Claims 13 and 27, as well as the claims that depend therefrom, are in condition for allowance.

Response to Argument

13. Applicants have amended the claims to clearly refer to the piezoelectric transducers, such as piezoelectric transducers 42, 44 as opposed to the transducer 30. The claims are now clearly supported by the original disclosure as described above under the section heading: "Claim Rejections – 35 USC §112."

Applicants have further amended the claims to refer to specific sides of the three-dimensional body of the piezoelectric transducer. The claims are now clearly definite as described above under the section heading: Claim Rejections – 35 USC §112."

The claims are not anticipated or obvious over the prior art as described above under the section headings: "Claim Rejections – 35 USC §102" and "Claim Rejections – 35 USC §103".

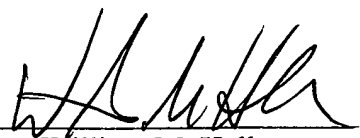
Conclusion

14. Applicants appreciate the opportunity to call the Examiner but believe that this amendment to the claims and the forgoing remarks fully address the issues raised by the Examiner. On the other hand, the Examiner is invited to call the undersigned if he has any matters to address that will facilitate allowance of the application.

In the event that Applicant has overlooked the need for an extension of time, additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefore and authorize that any changes be made to Deposit Account No.: 50-3010.

Applicants respectfully request favorable consideration and the timely issuance of a Notice of Allowance in this case.

Respectfully submitted,
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